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EXAMINER	
KAO, CHIH CHENG G	

ART UNIT	PAPER NUMBER
2882	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,887	SUZUKI ET AL.	
	Examiner	Art Unit	
	Chih-Cheng Glen Kao	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-11,14-17 and 22* is/are rejected.

7)☒ Claim(s) *7,12,13 and 18-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 May 2007* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on May 17, 2007. Some of these drawings are acceptable.

2. The drawings are objected for minor informalities. In the following format (location of objection; suggestion for correction), the following correction(s) may obviate the objection(s): (fig. 1, at reference numeral #54; fixing the label to read as "headrest motor", since the last "r" appears to be cutoff), (fig. 14, at reference numeral #54; fixing the label to read as "headrest motor", since the last "r" appears to be cutoff), and (fig. 15, at reference numeral #55; fixing the label to read as "headrest motor", since the last "r" appears to be cutoff).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 1 and 3-22 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and/or lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following correction(s) may obviate the objection(s): (claim 1, line 13, "means moves for executing"; inserting a comma before "for executing"), (claim 1, line 14; inserting a comma after "tomography"), (claim 11, line 3; inserting --a-- before "conical"), and (claim 14, line 3; inserting --or a-- before "photo diode array").

Claims 3-22 are objected to by virtue of their dependency. For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4-6, 10, 11, 14-17, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Arai et al. (US 6118842).

5. Regarding claim 1, Arai et al. discloses an X-ray computer tomography apparatus (abstract, lines 1-3) having an X-ray radiation means comprising an X-ray generator (fig. 2, #28) and a two-dimensional X-ray image sensor (fig. 2, #38), wherein an X-ray beam (fig. 2, from #28) is radiated on an object (fig. 2, object at #163) to be examined, while said X-ray generator and said X-ray image sensor move for X-ray circulating radiation (fig. 2, via #22) around an object to be examined (fig. 2, object at #163), with said object interposed therebetween, so as to hold their mutual facing positional relation (fig. 2), and wherein a first X-ray tomography is executed for obtaining a curved plane tomography image or a flat plane tomography image (abstract, "panoramic"), wherein a second X-ray tomography is executed for obtaining a computed tomography image of an interested area of said object (abstract, "CT"), said X-ray computer tomography apparatus comprising an object holding means (fig. 1, #12), and an object moving means (fig. 2, #10).

Note that recitations (i.e., wherein said object moving means moves, for executing said first X-ray tomography, said object holding means which is holding said object during said X-ray circulation radiation depending on a rotary angle of X-ray circulating radiation, with a center of an orbit of said X-ray circulating radiation fixed) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

6. Regarding claim 2, note that recitations (i.e., moving said object holding means depending on a rotary angle of X-ray circulating radiation during said X-ray circulating radiation, with a center of an orbit of said X-ray circulation radiation fixed, when executing said first X-ray tomography of said object) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

7. Regarding claim 4, note that recitations (i.e., wherein said first X-ray tomography is executed for obtaining an X-ray sectional image including a blurred image of regions other than a target sectional area through a curved plane tomography or a flat plane tomography in a manner such that said X-ray generator and said two-dimensional X-ray image sensor are moved around an object to be examined, with said object interposed therebetween, so as to hold their mutual facing positional relation, and wherein said second X-ray tomography is executed for obtaining an X-ray sectional image excluding a blurred image through computed tomography which computes and processes three-dimensional X-ray absorption coefficient data) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

8. Regarding claim 5, Arai et al. further discloses wherein movement of said X-ray generator and said two-dimensional X-ray image sensor is a rotary movement (fig. 2, via #22) or a parallel movement.

9. Regarding claim 6, note that recitations (i.e., wherein said second X-ray tomography is executed for obtaining an X-ray computed tomography image around a local region of said object in a manner such that the interested area of said object conforms to the rotary center of X-ray circulating radiation by moving said object holding means or said X-ray radiation means after said first X-ray tomography is finished) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

10. Regarding claim 10, note that recitations (i.e., wherein said first X-ray tomography is executed for obtaining a flat plane sectional image by mutually moving said X-ray generator and said two-dimensional X-ray image sensor held by a rotary arm in a direction opposite to each other, while turning said rotary arm around said object with said interested area interposed therebetween) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

11. Regarding claim 11, Arai et al. further discloses a conical X-ray beam (col. 7, lines 18-21).

Also note that recitations (i.e., wherein said second X-ray tomography is executed for obtaining an X-ray computed tomography image of a local region of said object by radiating a conical X-ray beam from said X-ray generator) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

12. Regarding claim 14, Arai et al. further discloses wherein said two-dimensional X-ray imaging sensor is comprises of any one of CdTe, MOS, CCD, XII, XICCD (col. 33, lines 35-43), or a photo diode array.

13. Regarding claim 15, Arai et al. would necessarily have wherein start and termination angles of the X-ray circulating radiation are set in such an appropriate position or an angle for a patient to easily come in and out of said object holding means corresponding to said first and second X-ray tomography, respectively (fig. 1).

14. Regarding claim 16, Arai et al. further discloses wherein an X-ray beam switching means is provided for switching a shape of an X-ray beam radiated from said X-ray generator in the first X-ray tomography and a shape of an X-ray beam radiated from said X-ray generator in the second X-ray tomography (col. 4, lines 45-62).

15. Regarding claim 17, Arai et al. further discloses wherein said curved plane X-ray tomography is executed for obtaining a dental panoramic image (fig. 24) or a curved sectional X-ray image for use in otolaryngology.

16. Regarding claim 22, Arai et al. further discloses wherein said object holding means is moveable in an axial direction of the X-ray rotary axis as well as in a vertical direction to the X-ray rotary axis (fig. 2, #10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. as applied to claim 1 above, and further in view of Suzuki et al. (US 2001/0021244).

Arai et al. discloses an apparatus as recited above. Arai et al. further discloses an image processing means (fig. 9, #236) for producing an X-ray sectional image by executing processing to an X-ray transmitted image detected by said two-dimensional X-ray image sensor (fig. 9, #38) in said first X-ray tomography, which is transmitted through said object (fig. 2, object at #163) by radiating X-rays from said X-ray generator (fig. 2, #28).

However, Arai et al. fails to disclose executing Time Delay Integration (TDI) processing.

Suzuki et al. teaches executing TDI processing (paragraphs 26 and 95).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Arai et al. with the TDI processing of Suzuki et al., since one would have been motivated to make such a modification for improving usability of the apparatus (paragraph 95) as shown by Suzuki et al.

18. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. ('842) as applied to claim 1 above, and further in view of Arai et al. (WO 00/57789) and Fujimoto (US 5386446).

19. Regarding claim 8, Arai et al. ('842) discloses an apparatus as recited above.

However, Arai et al. ('842) fails to disclose wherein an object holding means has a chair for holding a patient in a sitting position and a head fixing means at the upper part of the chair, and wherein said object holding means further has a pulse motor for moving said object in an axial direction of an X-ray rotary axis or in a vertical direction to the X-ray rotary axis.

Arai et al. ('789) teaches wherein an object holding means has a chair (page 29, lines 4-10) for holding a patient (fig. 10, R) in a sitting position and a head fixing means (fig. 10, #4a and 4b) at the upper part of the chair, and wherein said object holding means further has a motor (fig. 10, #41) for moving said object in an axial direction of an X-ray rotary axis or in a vertical direction (fig. 10, #41c) to the X-ray rotary axis. Fujimoto et al. teaches a pulse motor (col. 5, lines 18-20).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Arai et al. ('842) with the chair of Arai et al. ('789), since one would have been motivated to make such a modification for making a patient feel more comfortable.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Arai et al. ('842) with the pulse motor of Fujimoto et al., since these motors are art-recognized equivalents for their use in translating objects, and the selection of any of these known equivalents to translate objects would have been within the level of ordinary skill in the art. One would have been motivated to make such a modification for better accuracy and control of movement.

See US 6493415 (col. 20, lines 31-36) for a translation of Arai et al. ('789).

20. Regarding claim 9, Arai et al. ('842) further discloses wherein said X-ray radiation means has a rotary arm (fig. 2, #24) rotatable around the rotary center, said rotary arm holding said X-ray generator (fig. 2, #28) and said two-dimensional X-ray imaging sensor (fig. 2, #38) so as to keep their mutual facing positional relation.

Note that recitations (i.e., wherein said first X-ray tomography is executed for obtaining a curved plane sectional image in a manner such that said rotary arm turns around the object with the center of the orbit of the X-ray circulating radiation fixed during said first X-ray tomography, while said chair is moved along a predetermined imaging orbit in synchronism with the turning of said rotary arm) with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all

the structural limitations of the claim. Therefore, these recitations have not been given patentable weight. See MPEP 2114.

Allowable Subject Matter

21. Claims 7, 12, 13, and 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter.

22. Regarding claim 7, the prior art fails to disclose or fairly suggest an X-ray computer tomography apparatus, including a display means on which a first X-ray sectional image of an object taken by a first X-ray tomography is displayed, and an interested area selection means for selecting an interested area to be taken by a second X-ray tomography on said first X-ray sectional image displayed on said display means, and a calculation means of rotary center position for calculating movement data for relatively moving an object holding means or X-ray radiation means in a manner such that an X-ray rotary center conforms to said interested area selected by said interested area selection means, wherein said object holding means or said X-ray radiation means is moved depending on said movement data, and thereafter said X-ray radiation means is circulated with a center of an orbit of X-ray circulating radiation fixedly conformed to said interested area during X-ray circulating radiation, thereby executing said second X-ray tomography, in combination with all of the other limitations in the claim. Claims 12 and 13 contain allowable subject matter by virtue of their dependency.

23. Regarding claim 18, the prior art fails to disclose or fairly suggest an X-ray computer tomography apparatus, including a sectional image link means for subdividing in advance a second X-ray sectional image obtained by a second X-ray tomography into an assembly of X-ray sectional images comprised of plural X-ray sectional images cut out at a fixed interval at least in one direction of three dimensional directions and for linking each X-ray sectional image in said assembly of X-ray sectional images as the second X-ray sectional image to a first X-ray sectional image obtained by a first X-ray tomography corresponding to an imaging region, an image recording means for storing together with each positional information said first X-ray sectional image and said second X-ray sectional image, each linked to the corresponding information, and a corresponding image calling means for invoking the linked corresponding X-ray sectional image when at least one of said first X-ray sectional image and said second X-ray sectional image stored in said image recording means is read out and is shown on said display means, in combination with all of the other limitations in the claim. Claims 19-21 contain allowable subject matter by virtue of their dependency.

Response to Arguments

24. Applicant's arguments filed May 17, 2007, have been fully considered but they are not persuasive.

Regarding Arai et al. ('842), Applicant argues that Arai et al. does not disclose the object moving during X-ray photography. Applicant thereby concludes that Arai et al. does not disclose each and every element of Applicant's invention and that Arai et al. does not anticipate

claims 1, 2, 4-6, 10, 11, 14-17, and 22. The examiner does not find this argument persuasive. Regardless of whether Arai et al. discloses the object moving during X-ray photography, the relevant claim recitations (i.e., "wherein said object moving means moves, for executing said first X-ray tomography, said object holding means which is holding said object during said X-ray circulation radiation depending on a rotary angle of X-ray circulating radiation, with a center of an orbit of said X-ray circulating radiation fixed" as recited in claim 1 for example) have not been given patentable weight. Claim recitations with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. See MPEP 2114. Since Arai et al. teaches all the structural limitations of the claims, Arai et al. does anticipate claims 1, 2, 4-6, 10, 11, 14-17, and 22.

Regarding claims 8 and 9 and Arai et al. ('789), Applicant points out that at page 28, lines 4-10, there is no chair described. The examiner thanks Applicant for pointing out this discrepancy and notes that the section cited in the previous Office action was a typographical error. The section in Arai et al. ('789) that does describe a chair is at page 29, lines 4-10, not page 28. On page 29, Arai et al. ('789) describes the chair together with the object holding means being moved so as to position the patient.

Furthermore with regards to Fujimoto et al., in response to Applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In this case, Arai et al. ('789) teaches wherein object holding means has a chair. Fujimoto et al. teaches wherein object holding means has a pulse motor for moving in general. Therefore, the combination of

references suggests wherein object holding means has a chair (Arai et al. ('789)), and wherein object holding means further has a pulse motor for moving (Fujimoto et al.).

In conclusion, Applicant's arguments are not persuasive, and the claims remain rejected.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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